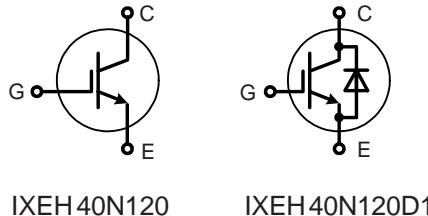
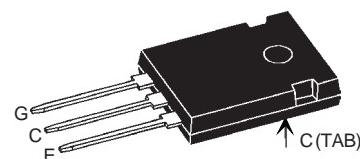


NPT³ IGBT

I_{C25} = 60 A
V_{CES} = 1200 V
V_{CE(sat) typ.} = 2.4 V



TO-247 AD

**IGBT**

Symbol	Conditions	Maximum Ratings		
V _{CES}	T _{VJ} = 25°C to 150°C	1200		V
V _{GES}		± 20		V
I _{C25}	T _C = 25°C	60	A	
I _{C90}	T _C = 90°C	40	A	
I _{CM} V _{CEK}	{ V _{GE} = ±15 V; R _G = 39 Ω; T _{VJ} = 125°C RBSOA, Clamped inductive load; L = 100 μH	50	A	V _{CES}
t _{sc} (SCSOA)	V _{CE} = 900V; V _{GE} = ±15 V; R _G = 39 Ω; T _{VJ} = 125°C non-repetitive	10	μs	
P _{tot}	T _C = 25°C	300		W

Symbol	Conditions	Characteristic Values		
		(T _{VJ} = 25°C, unless otherwise specified)	min.	typ.
V _{CE(sat)}	I _C = 40 A; V _{GE} = 15 V; T _{VJ} = 25°C T _{VJ} = 125°C	2.4 2.8	3.0	V
V _{GE(th)}	I _C = 1 mA; V _{GE} = V _{CE}	4.5	6.5	V
I _{CES}	V _{CE} = V _{CES} ; V _{GE} = 0 V; T _{VJ} = 25°C T _{VJ} = 125°C	0.4	0.4	mA
I _{GES}	V _{CE} = 0 V; V _{GE} = ± 20 V		200	nA
t _{d(on)} t _r t _{d(off)} t _f E _{on} E _{off}	{ Inductive load, T _{VJ} = 125°C V _{CE} = 600 V; I _C = 40 A V _{GE} = ±15 V; R _G = 39 Ω	85 50 440 50 6.1 3.0		ns ns ns ns mJ mJ
C _{ies} Q _{Gon}	V _{CE} = 25 V; V _{GE} = 0 V; f = 1 MHz V _{CE} = 600 V; V _{GE} = 15 V; I _C = 25 A	2 250		nF nC
R _{thJC}			0.42	K/W

Features

- NPT³ IGBT
 - low saturation voltage
 - positive temperature coefficient for easy paralleling
 - fast switching
 - short tail current for optimized performance in resonant circuits
- optional HiPerFRED™ diode
 - fast reverse recovery
 - low operating forward voltage
 - low leakage current
- TO-247 package
 - industry standard outline
 - epoxy meets UL 94V-0

Applications

- AC drives
- DC drives and choppers
- Uninterruptible power supplies (UPS)
- switched-mode and resonant-mode power supplies
- inductive heating, cookers

Diode [D1 version only]

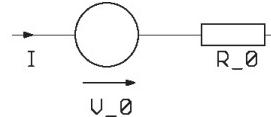
Symbol	Conditions	Maximum Ratings		
I _{F25}	T _C = 25°C	60	A	
I _{F90}	T _C = 90°C	35	A	

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V _F	I _F = 40 A; T _{VJ} = 25°C T _{VJ} = 125°C	2.6 2.0	3.0	V V
I _{RM} t _{rr} E _{rec(off)}	I _F = 30 A; di _F /dt = -500 A/μs; T _{VJ} = 125°C V _R = 600 V; V _{GE} = 0 V	51 180 1.8	A ns mJ	
R _{thJC}			1.0	K/W

Component

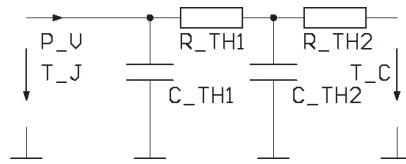
Symbol	Conditions	Maximum Ratings		
T _{VJ}		-55...+150		°C
T _{stg}		-55...+150		°C
M _d	mounting torque	0.8...1.2		Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R _{thCH}	with heatsink compound	0.25		K/W
Weight		6		g

Equivalent Circuits for Simulation**Conduction**

IGBT (typ. at V_{GE} = 15 V; T_J = 125°C)
V_θ = 0.95 V; R_θ = 45 mΩ

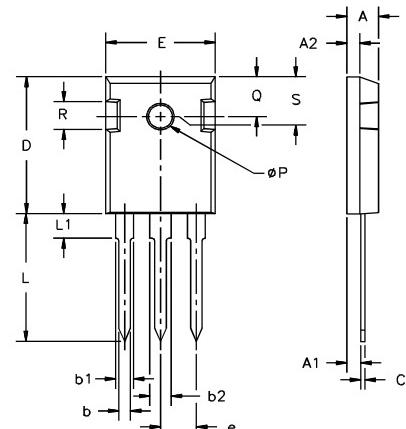
Diode (typ. at T_J = 125°C)
V_θ = 1.26V; R_θ = 15 mΩ

Thermal Response**IGBT**

C_{th1} = 0.007 J/K; R_{th1} = 0.215 K/W
C_{th2} = 0.187 J/K; R_{th2} = 0.205 K/W

Diode

C_{th1} = 0.006 J/K; R_{th1} = 0.649 K/W
C_{th2} = 0.113 J/K; R_{th2} = 0.351 K/W

TO-247 AD Outline

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
φP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15	BSC	.242	BSC

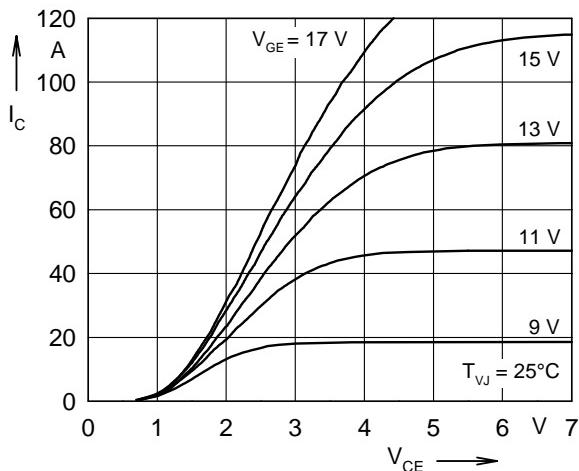


Fig. 1 Typ. output characteristics

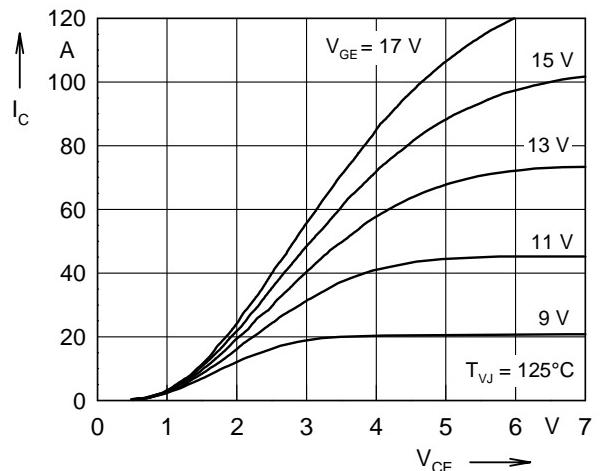


Fig. 2 Typ. output characteristics

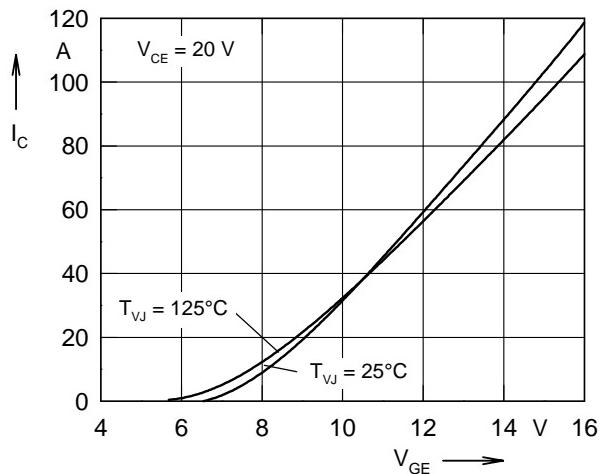


Fig. 3 Typ. transfer characteristics

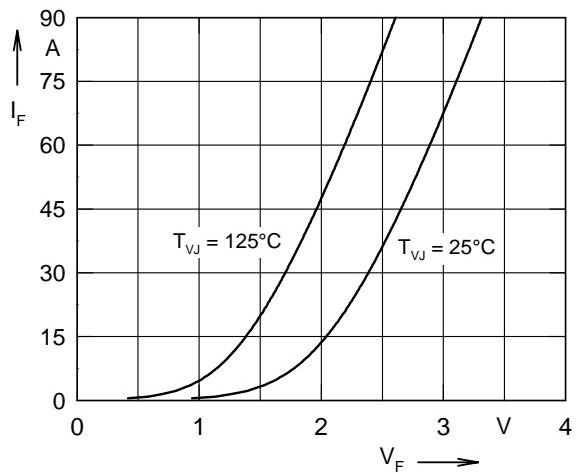


Fig. 4 Typ. forward characteristics of free wheeling diode

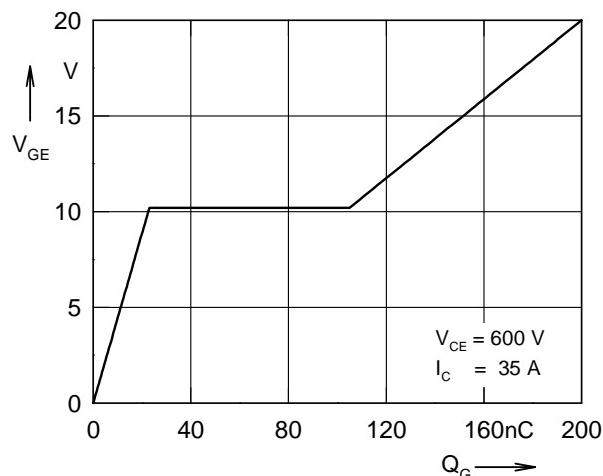


Fig. 5 Typ. turn on gate charge

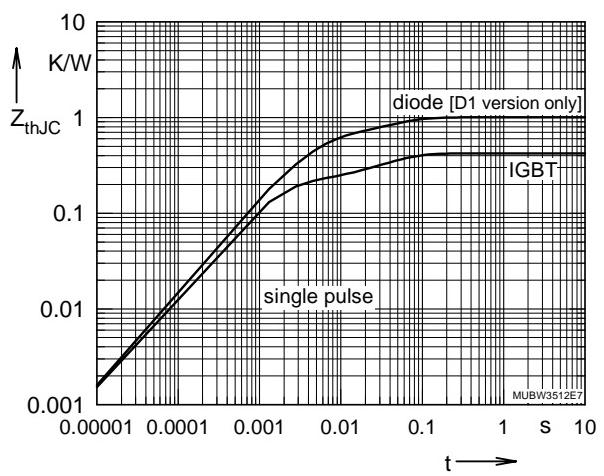


Fig. 6 Typ. transient thermal impedance

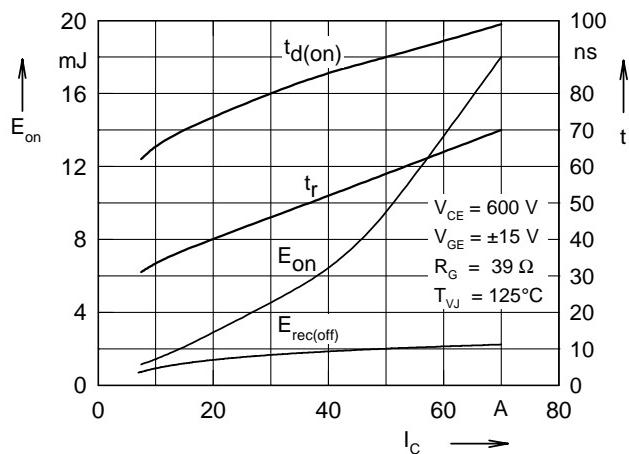


Fig. 7 Typ. turn on energy and switching times versus collector current

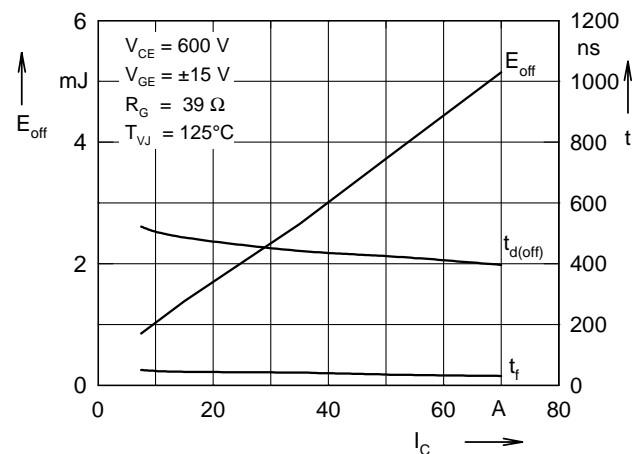


Fig. 8 Typ. turn off energy and switching times versus collector current

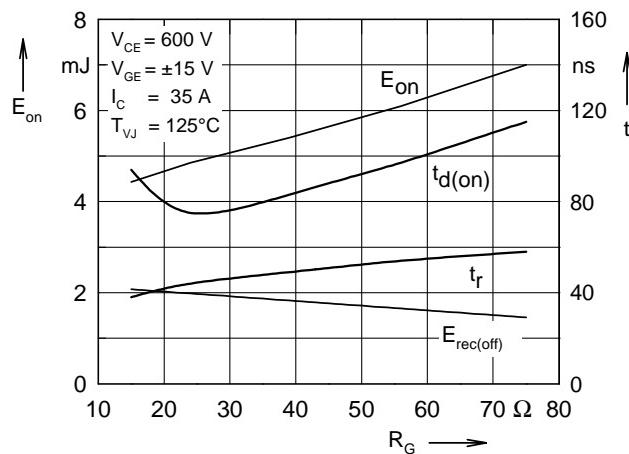


Fig. 9 Typ. turn on energy and switching times versus gate resistor

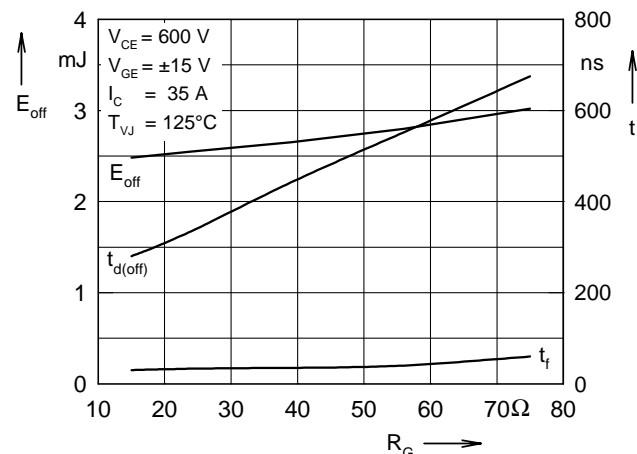


Fig.10 Typ. turn off energy and switching times versus gate resistor

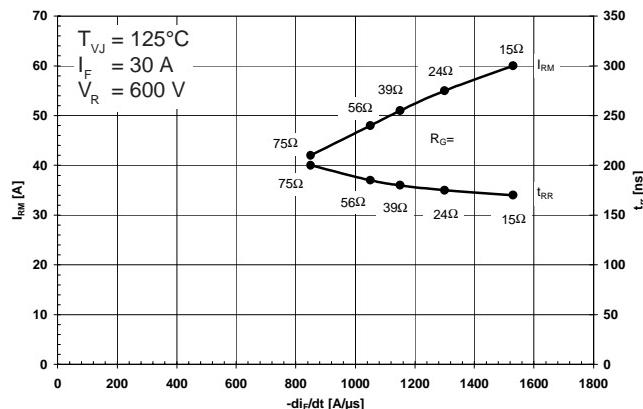


Fig. 11 Typ. turn off characteristics of free wheeling diode

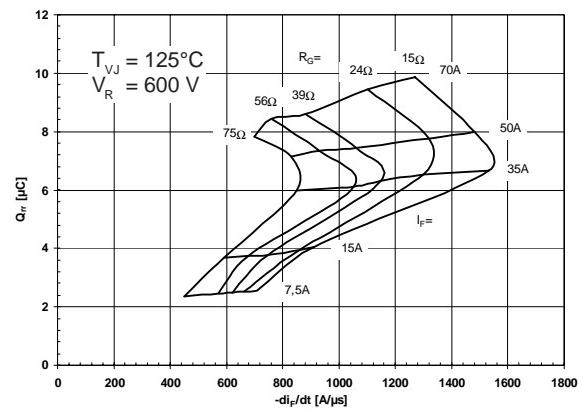


Fig. 12 Typ. turn off characteristics of free wheeling diode